REMARKS

The issues outstanding in the office action mailed August 2, 2006, are rejections under 35 U.S.C. §§102 and 103. The examiner is thanked for indicating withdrawal of the prior rejection under 35 U.S.C. §103.

Rejections under 35 U.S.C.§102

Claims 1-3 and 5-7 have been rejected under 35 U.S.C. §102(b) over "El quillay controla los tóxicos" (San Martin et al.). Reconsideration of this rejection is respectfully requested. San Martin discloses a research plan, and, at best, a suggestion that extracts of Quillaja might be useful in copper refining. The authors teach that more work is necessary to determine the technical parameters that will allow the use of extracts in the mining process. A reference which is not enabling cannot be anticipatory, see, for example, *Akzo N.V. the US International Trade Commission*, 808 F2d. 1471, 1 U.S.P.Q. 2d. 1241 (Fed. Cir. 1986). An anticipatory reference must enable one of ordinary skill in the art to understand the nature and operation of the invention, see *In re Spada*, 911 F2d. 705, 15 U.S.P.Q. 2d. 1655 (Federal Circuit 1990). A mere suggestion that the extracts might be useful in copper refining falls far short of anticipating the present claims to a method for inhibiting or suppressing acid midst generated in copper electrowinning methods, by adding a *soluble surfactant* comprising a *refined extract* of Quillaja. Accordingly, it is submitted that San Martin does not anticipate the presently claimed methods. Withdrawal of this rejection is therefore respectfully requested.

Rejections under 35 U.S.C. §103

Claims 1-7 have been rejected under 35 U.S.C. §103 over Bultman '990 taken with Niwase (JP'345) and Nord and MacKinnon. Reconsideration of this rejection is also respectfully requested.

As will be recalled Bultman discloses a process electrowinning of copper obtained by solvent extraction; specifically, an improvement therein wherein electrowinning is conducted with an electrolyte containing a *fluoroaliphatic* surfactant, which surfactant inhibits mist forming on the surface of the electrolyte. See, for example, column 3, lines 30 - 35. Patentees teach that the

fluoroaliphatic surfactant has at least one cationogenic group which is a radical of a base, and containing about 30% by weight of fluorine in the form of carbon-bonded fluorine in a fluoroaliphatic radical, the fluoroaliphatic radical itself having at least four carbon atoms and at least a terminal perfluoro methyl group. See column 3, lines 35 - 42. All throughout patentees' disclosure, the improvement based on *fluoroaliphatic* surfactants is taught. See, for example, column 4, lines 57 - 59, column 5, lines 9 - 12 and the formulae set forth at columns 7 - 9 of the patent. No other surfactants, other than fluoroaliphatic surfactants, are taught by patentees.

As acknowledged at page 4 of the present rejection, Bultman fails to teach the surfactant therein as a soluble surfactant which is an extract of the *Quillaja Saponaria* Molina tree. In order to remedy this deficiency, the present and prior Office Actions cite Niwase, teaching that extracts from the *Quillaja Saponaria* Molina tree "had excellent surfactant properties." (Nord is cited solely to provide further detail of the structure of the materials in *Quillaja Saponaria*. As such, it adds nothing to the disclosures of the above-discussed references.)

It is again submitted that, regardless of the existence of any such teaching in this and other secondary references relied upon in the Office Action, the conclusion drawn at the bottom of page 4 of the Rejection, that it "therefore" would have been obvious to use the surfactant extract from *Quillaja Saponaria* Molina in the electrowinning process of the primary reference, is contrary to established patent law.

As Applicants have previously noted, in order to support a rejection under 35 U.S.C §103 based on obviousness, it is necessary that one of ordinary skill in the art has *motivation* to combine references. See, for example, *In re Laskowski*, 10 U.S.P.Q.2d 1397 (Fed. Cir. 1989) among many others. *Laskowski* held that the mere fact that references *can* be combined, does not establish motivation, and thus the obviousness to do so, without some suggestion to one of ordinary skill in the art, either from the references themselves or from knowledge in the art, of a reason to make the combination, and, moreover, of a "reasonable expectation of success" in the operability of such a combination or modification. It is respectfully submitted that the mere fact that a surfactant has "excellent" surfactant properties does not render that surfactant, without more, obvious to use in the copper electrowinning process of the primary reference, unless one of ordinary skill in the art would have a reasonable expectation of success with such a surfactant in the electrowinning process of the

primary reference. In the present situation, such an expectation is maintained to be absent on several bases.

First, *Quillaja Saponaria* Molina is *not* a flurosurfactant. For example, attention is directed to Figure 10, setting forth the formula of one such component of the extract. It is well known in the art that *Quillaja Saponaria* Molina extract is not a fluorosurfactant, due to the triterpene chemical structure. It is clear from the teachings of the primary reference that not *any* surfactant is functional therein, but that patentees' *improvement* requires a fluorosurfactant. See, for example, the above-noted passages of the reference. Thus, regardless of any "excellent" surfactant properties known for *Quillaja Saponaria*, this alone is insufficient for one of ordinary skill in the art to find the motivation to employ such a non-fluorosurfactant in the electrowinning process of the primary reference, since the "excellent" properties of a surfactant are *specific* to a given use, and are *not per se* found across a spectrum of uses, as is well known in the art.

The disclosure of Niwase is to a process utterly divorced from, and having nothing in common with, that of the primary reference. The secondary reference teaches that *Quillaja Saponaria* extract is useful in *shampoo*, and produces beneficial properties for hair. As such, it can be seen that the problem addressed by this reference is of no relation whatsoever to the process of the primary reference, where the conditions of use are far different. In fact, the expectation in the art is the opposite to that theorized in the Office Action: the "excellent" surfactant properties of the material of the secondary reference, said properties being relevant to shampoos, would not be expected to translate in any manner whatsoever to the process of the primary reference.

While various surfactants included saponins can be used as foaming agents in beverages, cosmetics, etc., the choice of surfactants suitable for the suppression of acid mist in electrowinning is not a simple matter. In fact, the only commercial anti-misting agent used widely is a surfactant which contains a fluorocarbon alkyl group connected to an amphoteric group, sold by 3M Corporation under the designation FC-1100 Fluorad™. Such a lack of alternative products speaks volumes against the assumption in the Office Action that any "excellent" surfactant could be used in electrowinning. In fact, electrowinning surfactants have to provide various critical properties such as minimum production of foam, ability to lower surface tension under extreme acidic conditions (e.g., pH of 0 at 50°C) and to avoid interference with copper recovery or retardation of phase separation

between organic and aqueous phases when used with ion-exchange materials. Indeed, many candidates surfactants have been shown to exhibit the draw back of being extracted in the organic phase, or interfering with separation time of the organic phase and electrolyte. Such characteristics render them unacceptable in commercial electrowinning operations. Moreover, conditions in electrowinning are different than those found in beverages or cosmetics such as those in the documents cited by the Examiner. The acidity and general process conditions of electrowinning are completely different than such household uses, and the surfactant's ability to perform in such household uses is in no way a predictor of ability to perform, much less to avoid interference with electrowinning process parameters such as current efficiency and cathode quality.

In short, if the assumption in the Office Action that any "excellent" surfactant is obvious for use in electrowinning were true, widely available surfactants such as sodium lauryl sulfate would likely be used to reduce acid mist in electrowinning. Indeed, such products have been tested: Alfantazi et al., 2004, " The Use of Organic Additives to Suppress Acid Mist in Copper Electowinning", *Canadian Metallurgical Quarterly,* **43**, pp. 449-460. These products, have not, however resulted in commercial products accepted in the electrowinning industry as a result of the production of abundant foam over the electrolyte, and alteration of cathode quality. Thus, the attempt in the current rejection to bridge the gap between beverage and shampoo surfactants and copper electrowinning, by citing various instances where similar surfactants are used in copper processing and shampoos, is not well taken. Instead, one of ordinary skill in the art knows that copper electrowinning requires specific surfactant characteristics, which references in diverse art areas such as shampoos do not teach or possess. Thus, the sweeping assumption advanced in the office action, that *any* surfactant from the shampoo art would be useful in copper refining, is simply not acceptable to one of ordinary skill in the art.

For example surfactants are useful for decreasing the superficial tension of aqueous solutions due the water/air inter-phase adsorption. However, this is only one of the properties that the surfactants should have to control acid gas. Other properties that the current invention has (which are not disclosed by the prior art documents regarding the acid gas inhibition) are as follows:

i) Purified Quillaja extract is resistant to the combination of acid media (180 g/l sulphuric acid) and high temperatures (over 45°C) occurring in the copper electrowinning process. (EW).

ii) Typically, if a surfactant is resistant enough to acid/heat conditions of EW, such surfactant will generate a operational problem downstream (solvent extraction). The purified Quillaja extract instead, is degradated in accordance to a specific kinetic which fulfills simultaneously the control of acid mist and avoids the accumulation of surface active components which could affect the solvent extraction occurring downstream. This condition, specific to Quillaja, cannot be extended to other surfactants. In fact, if surfactants used are not degraded properly, the process is strongly affected.

iii) The purified Quillaja extract is highly soluble in the electrolyte and almost insoluble in the organic solvent, what is important to the process and very specific to this surfactant. Indeed, it cannot be extended to other surfactants without a thorough study of suitability for the application.

Accordingly, one of ordinary skill in the art simply cannot accept the sweeping conclusion advanced in the office action. Accordingly, it is submitted that the combination of references fails to suggest the presently claimed methods, and withdrawal of this rejection is also respectfully requested.

The claims of the application are submitted to be in condition to allowance, and passage to issue is strongly urged. Should the Examiner have any questions or comments, he is cordially invited to telephone the undersigned at the number below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

_____/Harry B. Shubin___
Harry B. Shubin, Reg. No. 32,004
Attorney/Agent for Applicant(s)

MILLEN, WHITE, ZELANO
& BRANIGAN, P.C.
Arlington Courthouse Plaza 1, Suite 1400
2200 Clarendon Boulevard
Arlington, Virginia 22201
Telephone: (703) 243-6333
Facsimile: (703) 243-6410

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